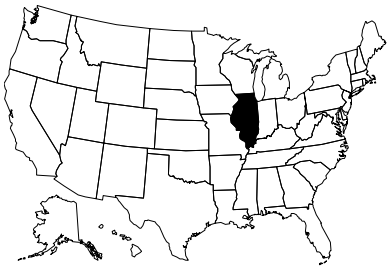
ILLINOIS



Contact Information

Gregg Good, Manager - Surface Water Section
Illinois Environmental Protection Agency (IEPA)
1021 North Grand Avenue East ■ Springfield, Illinois 62794-9276
Phone 217/782-3362 ■ Fax 217/785-1225
email: gregg.good@epa.state.il.us
IEPA Bureau of Water homepage: http://www.epa.state.il.us/water/

Program Description

Illinois EPA (IEPA) conducts intensive river basin surveys on a five-year rotational basis in cooperation with the Illinois Department of Natural Resources (IDNR). These surveys are a major source of information for annual 305(b) assessments. Illinois has 33 major river basins within its borders. Stations sampled by IEPA and IDNR are selected on the basis of where intensive data are currently lacking or historical data need updating. Water chemistry and biological (fish and macroinvertebrate) data along with qualitative and quantitative instream habitat information, including stream discharge, are collected to characterize stream segments within the basin, identify water quality conditions, and evaluate aquatic life use impairment. Fish tissue contaminant and sediment chemistry sampling are also conducted to screen for the accumulation of toxic substances.

Illinois' "biological expectations" are based on a regional reference site approach that enables within-region comparisons between the aquatic community at any stream site and the reference expectation. The regional reference site approach is a key component of biocriteria. The approach ensures reasonably attainable biological goals that recognize and account for the unique combination of regional land form, land use, and physical habitat characteristics, which influence the distribution of fish, macroinvertebrates and other aquatic organisms. Illinois is currently developing this framework, which includes refinement of existing biological assessment tools and, where needed, development of new state-of-the-art monitoring approaches.

Illinois EPA is working with IDNR, USEPA, members of the agricultural, industrial, academic and regulated communities, as well as outside contractors, and other interested parties to develop biological criteria for streams and rivers. This approach to biocriteria will enable IEPA to better assess the ecological/environmental quality of Illinois rivers and streams and should allow the Agency to continue to update and refine the stream use designations contained in Illinois' water quality standards.

Documentation and Further Information

Illinois Water Quality Report 2002 (CWA Section 305(b) Report), July 2002, IEPA, Bureau of Water: http://www.epa.state.il.us/water/water-quality/report-2002/305b-2002.pdf

2001 305(b) Summary Report (1999 data), Rivers and Streams: http://www.epa.state.il.us/water/water-quality/report-2001/report-2001.pdf

Condition of Illinois Water Resources - menu of Illinois 305(b) Reports and Assessments, including maps and graphs: http://www.epa.state.il.us/water/water-quality/index.html

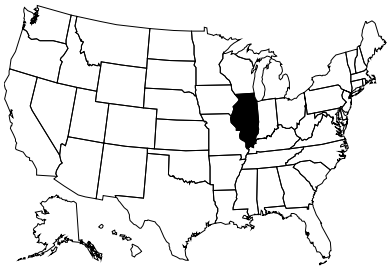
Illinois Targeted Watershed Approach: http://www.epa.state.il.us/water/targeted-watershed/index.html

IEPA Bureau of Water, Surface Water Quality Monitoring and Assessment Programs homepage: http://www.epa.state.il.us/water/surface-water/index.html

IEPA Bureau of Water, River and Stream Monitoring Program homepage, with links to biocriteria development and other relevant information: http://www.epa.state.il.us/water/surface-water/river-stream-mon.html

Hite, R.L. and B.A. Bertrand. 1989. *Biological Stream Characterization (BSC): A Biological Assessment of Illinois Stream Quality*, Special Report No. 13 of the Illinois State Water Plan Task Force. Illinois Environmental Protection Agency.

ILLINOIS



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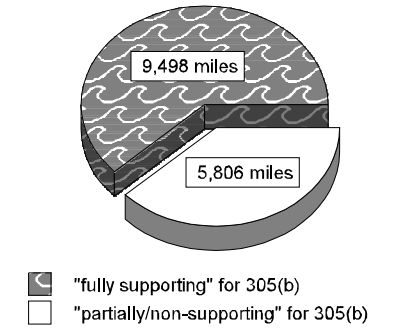
Programmatic Elements

Uses of bioassessment within overall water quality program	✓	problem identification (screening)
	✓	nonpoint source assessments
		monitoring the effectiveness of BMPs
	✓	ALU determinations/ambient monitoring
	UD	promulgated into state water quality standards as biocriteria
	✓	support of antidegradation
	✓	evaluation of discharge permit conditions
	✓	TMDL assessment and monitoring
		other:
Applicable monitoring designs	✓	targeted (i.e., sites selected for specific purpose) *(special projects and specific river basins or watersheds)*
	✓	fixed station (i.e., water quality monitoring stations) *(comprehensive use throughout jurisdiction)*
		probabilistic by stream order/catchment area
		probabilistic by ecoregion, or statewide
	✓	rotating basin *(comprehensive use throughout jurisdiction)*
		other:

Stream Miles

Total miles *(determined using RF3 and existing maps)*	**86,021**
Total perennial miles	30,246
Total miles assessed for biology	**15,304**
fully supporting for 305(b)	9,498
partially/non-supporting for 305(b)	5,806
listed for 303(d)*	–
number of sites sampled	115
number of miles assessed per site**	site specific

15,304 Miles Assessed for Biology



*Total miles listed for 303(d) is a subset of the miles partially/non-supporting for 305(b) and will be determined in the next update.

**10 miles for wadeable sites and 25 miles for non-wadeable sites with some site-specific detailing following the 1997 305(b) guidance.

Aquatic Life Use (ALU) Designations and Decision-Making

ALU designation basis	Single Aquatic Life Use	
ALU designations in state water quality standards	Secondary contact and indigenous aquatic life use waters (IL Title 35, Subtitle C, Chapter I, Part 303.204)	
Narrative Biocriteria in WQS	under development - IEPA has written guidelines and thresholds for fish and invertebrate indices that are not part of the WQS, but are in the 305(b) guidelines (see flowchart). These numeric biological measures are used as decision criteria to determine attainment of ALU.	
Numeric Biocriteria in WQS	none	
Uses of bioassessment data in integrated assessments with other environmental data (e.g., toxicity testing and chemical specific criteria)	✓	assessment of aquatic resources
	✓	cause and effect determinations
	✓	permitted discharges
	✓	monitoring (e.g., improvements after mitigation)
	✓	watershed based management
Uses of bioassessment/ biocriteria in making management decisions regarding restoration of aquatic resources to a designated ALU	Data have been used to make permitting and nonpoint source BMP decisions. Illinois DNR's Biological Stream Characterization (BSC) program is used to determine antidegradation tiers and to influence IDNR natural heritage area designations.	

Reference Site/Condition Development*

Number of reference sites	**120 total**	
Reference site determinations*	✓	site-specific
		paired watersheds
		regional (aggregate of sites)
		professional judgment
	✓	other: watershed measures of physical and chemical disturbance
Reference site criteria	Illinois EPA is in the process of formally defining reference criteria.*	
Characterization of reference sites within a regional context	✓	historical conditions
	✓	least disturbed sites
		gradient response
	✓	professional judgment
		other:
Stream stratification within regional reference conditions	✓	ecoregions (or some aggregate)
		elevation
	✓	stream type
	✓	multivariate grouping
	✓	jurisdictional (i.e., statewide)
		other:
Additional information		reference sites linked to ALU
		reference sites/condition referenced in water quality standards
	✓	some reference sites represent acceptable human-induced conditions

*IEPA currently does not use "reference conditions" for making use-support decisions. Reference conditions were not explicitly defined or used for the present stream IBIs. A not-yet completed reevaluation of Illinois IBIs used reference conditions to develop the new indices. IEPA uses a general concept of least impacted reference condition where there are no data available; no further quantitative development has been done.

Field and Lab Methods

Assemblages assessed	✓	benthos *(100-500 samples/year; single season, multiple sites – not at watershed level)*
	✓	fish *(100-500 samples/year; single season, multiple sites – not at watershed level)*
		periphyton
		other:
Benthos		
sampling gear		collect by hand, dipnet; 500-600 micron mesh
habitat selection		richest habitat, rifle/run (cobble), multihabitat and woody debris
subsample size		300 count and entire sample
taxonomy		combination - order, family, genus and species
Fish		
sampling gear		backpack and boat electrofishers, and seine; 1/4" and 3/8" mesh
habitat selection		pool/glide, riffle/run (cobble) and multihabitat
sample processing		length measurement, biomass - individual and batch
subsample		none
taxonomy		species
Habitat assessments		visual based and quantitative measurements; performed with bioassessments
Quality assurance program elements		standard operating procedures, quality assurance plan, periodic meetings and training for biologists, sorting and taxonomic proficiency checks

Data Analysis and Interpretation

Data analysis tools and methods	✓	summary tables, illustrative graphs
	✓	parametric ANOVAs
	✓	multivariate analysis
	✓	biological metrics *(aggregate metrics into an index)*
	✓	disturbance gradients
	✓	other: nonparametric statistical tests
Multimetric thresholds		
transforming metrics into unitless scores		Metric values representing least-disturbed conditions statewide are stratified by region; within-region regression of each metric vs. environmental covariate, e.g., stream size and slope, defines benchmark for defining metric-scoring ranges.
defining impairment in a multimetric index		Thresholds are based on the possible index scoring range divided into discrete categories and are not driven by reference sites.
Evaluation of performance characteristics		repeat sampling
		precision
Not currently evaluated		sensitivity
		bias
		accuracy
Biological data		
Storage		IEPA database and spreadsheets
Retrieval and analysis		SAS, Systat, database, spreadsheet, statistical-analysis and statistical-graphics applications, including MS Access, FoxPro, Excel, QuattroPro, Minitab, and Sigma Plot